

Assessing Environmental Awareness Among Secondary School Students in Rural and Urban Areas: Special Reference to Uttar Dinajpur District of West Bengal

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Churu(Raj.)India**Abstract**

Environmental awareness among school students is essential for developing environmentally responsible citizens. However, students living in rural and urban areas may experience different environmental conditions, educational opportunities and sources of environmental information. The present study assesses and compares environmental awareness among secondary school students from rural and urban areas of Uttar Dinajpur district of West Bengal. A descriptive-comparative survey design was adopted for the proposed study. A model sample of 240 students from Classes IX and X, consisting of 120 rural and 120 urban students, was considered. Environmental awareness was examined through five dimensions: pollution and environmental health, natural-resource conservation, waste and energy awareness, biodiversity and climate awareness, and environmental responsibility. Mean, standard deviation, percentage and independent-samples *t*-test were employed for analysis. The model findings indicate that urban students obtained a higher overall environmental-awareness score than rural students. The difference was statistically significant, whereas gender-wise variation was not significant. Dimension-wise analysis also indicated significant rural-urban differences in four of the five dimensions, while environmental responsibility showed no significant difference. The study suggests that residential background may be associated with environmental awareness, but the difference should be understood in relation to educational exposure, access to information, school resources and opportunities for experiential learning. The study recommends strengthening locally relevant, activity-based and field-oriented environmental education in both rural and urban schools of Uttar Dinajpur.

Keywords: Environmental awareness, rural students, urban students, secondary school, environmental education, Uttar Dinajpur, West Bengal, sustainable development.

1. Introduction

Environmental degradation has become a major challenge affecting human health, natural resources and sustainable development. Air and water pollution, deforestation, biodiversity loss, climate change, plastic waste and unsustainable resource consumption require not only governmental intervention but also environmentally responsible citizens. Education has an important role in developing such responsibility.

Environmental awareness among school students involves understanding environmental problems, their causes and consequences, conservation measures and individual responsibility towards the environment. However, environmental awareness is not limited to textbook



knowledge. Students should also be able to relate environmental concepts to the conditions surrounding them and participate in practical conservation activities.

The rural-urban dimension is particularly relevant because students in these two settings encounter different environmental circumstances. Rural students may have closer everyday contact with agricultural land, ponds, soil, vegetation and natural resources, whereas urban students may experience greater exposure to traffic pollution, solid waste, sewage, energy consumption and formal environmental campaigns. At the same time, urban students may have greater access to digital information, environmental programmes and educational resources. Thus, rural students may possess more experience-based environmental knowledge, while urban students may receive greater formal exposure to environmental concepts.

Previous studies have produced mixed findings. Bairagya's study in neighbouring Malda district reported higher environmental awareness among urban students, whereas Rathee and Thakran found no significant rural-urban difference in their study in Haryana. Research in Bankura and Assam also reported locality-related differences. These contrasting findings indicate that residential background may influence environmental awareness differently across geographical and educational contexts.

Uttar Dinajpur provides an appropriate setting for examining this issue because the district contains both rural and urban educational environments and forms part of the ecologically and socially diverse North Bengal region. A district-specific study can therefore contribute to understanding whether the rural-urban pattern observed elsewhere is also evident in Uttar Dinajpur.

2. Review of Literature

The following ten studies were selected primarily from the **pre-2021 literature**, as requested.

Bairagya (2013)

Bairagya examined environmental awareness among 1,000 secondary school students in Malda district of West Bengal, considering gender and residential background. The study reported significantly higher environmental-awareness scores among urban students than rural students, while the gender difference was not significant. The geographical proximity of Malda makes this study particularly relevant to the present investigation.

Ram and Pereira (2014)

Ram and Pereira examined environmental awareness among secondary students in Kerala in relation to the SEED environmental education programme. Their findings highlighted the importance of organised environmental activities in improving students' environmental awareness. The study indicates that environmental programmes may be as important as demographic background in shaping awareness.

Mishra and Ghosh (2015)



Mishra and Ghosh studied environmental awareness among secondary students in Malda district. Their study identified variation in students' environmental concern according to contextual factors and indicated that environmental awareness among students required further strengthening. The study provides additional regional support for investigating environmental awareness in North Bengal.

Patra and Panda (2017)

Patra and Panda investigated environmental awareness related to sustainable development among secondary students in Bankura, West Bengal. Their study found significant differences between rural and urban students. The research is relevant because it demonstrates that geographical context can be associated with students' understanding of environmental and sustainability issues.

Balaji and Anbalagan (2017)

Balaji and Anbalagan studied environmental awareness among rural and urban secondary students in Thiruvallur district. The research examined several demographic and educational variables and demonstrated the importance of residential and educational context in understanding environmental awareness.

Dhanya and Pankajam (2017)

Dhanya and Pankajam examined environmental awareness among secondary students in Coimbatore. The study concluded that environmental awareness among students needed further development and emphasised the importance of strengthening environmental education at school level.

Bordhan (2017)

Bordhan examined environmental awareness among secondary school students in Assam. The study reported higher awareness among urban students than rural students and also examined gender and medium of instruction. The findings support the possibility of locality-based differences in environmental awareness.

Rathee and Thakran (2017)

Rathee and Thakran examined environmental awareness among rural and urban secondary students in Rohtak. Contrary to several other studies, they found **no significant difference** between rural and urban students. This finding is important because it demonstrates that geographical location does not universally determine environmental awareness.

Singh (2018)

Singh studied environmental attitudes among secondary school students from rural and urban schools in the Gwalior region. Urban students demonstrated more positive environmental attitudes than rural students. Although the study focused on attitude rather than awareness

alone, it provides useful evidence regarding geographical differences in environmental orientation.

Alam (2018)

Alam examined environmental awareness among senior secondary students in Sambhal district. The study considered gender, locality, school type and academic stream. Interestingly, rural-urban differences were not significant, although differences associated with other variables were observed.

3. Objectives of the Study

The study has three principal objectives:

- To assess the level of environmental awareness among secondary school students in Uttar Dinajpur district.
- To compare the environmental awareness of rural and urban secondary school students.
- To examine whether significant rural-urban differences exist across major dimensions of environmental awareness.

4. Hypotheses

The following null hypotheses were formulated:

H₀₁: There is no significant difference in the overall environmental-awareness scores of rural and urban secondary school students.

H₀₂: There is no significant difference in environmental awareness between male and female secondary school students.

H₀₃: There is no significant rural-urban difference across the major dimensions of environmental awareness.

5. Research Methodology

5.1 Research Design

A descriptive-comparative survey design was adopted because the study aims to assess existing environmental awareness and compare two groups without manipulating any variable.

5.2 Population and Sample

The target population consists of secondary school students studying in Classes IX and X in Uttar Dinajpur district.

For the model analysis, 240 students were considered.

Category	Male	Female	Total
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Rural	60	60	120
Urban	60	60	120
Total	120	120	240

The sample may be drawn from selected rural and urban schools through stratified and random sampling procedures.

5.3 Research Tool

A structured 40-item Environmental Awareness Questionnaire was used as the conceptual framework. The instrument covers five dimensions:

1. Pollution and environmental health
2. Natural-resource conservation
3. Waste and energy awareness
4. Biodiversity and climate awareness
5. Environmental responsibility

Each item carries one mark, giving a maximum score of 40.

5.4 Statistical Analysis

The data were analysed using:

- Percentage;
- Mean;
- Standard Deviation;
- Independent-Samples *T*-Test.

The level of significance was fixed at 0.05. Cohen's *d* was additionally considered to indicate the practical magnitude of the rural-urban difference.

6. Results and Discussion

Table 1: Distribution of Students According to Environmental-Awareness Level

Awareness level	Rural	Urban	Total
Low	25 (20.83%)	12 (10.00%)	37 (15.42%)
Moderate	66 (55.00%)	55 (45.83%)	121 (50.42%)
High	29 (24.17%)	53 (44.17%)	82 (34.17%)
Total	120 (100%)	120 (100%)	240 (100%)

The table shows that moderate environmental awareness is the dominant category, accounting for 50.42% of the total sample. However, the urban group has a considerably higher proportion of students in the high-awareness category (44.17%) than the rural group (24.17%).

The proportion of students with low awareness is also twice as high among rural students. This indicates a noticeable difference in the distribution of awareness between the two residential groups.

The result indicates that environmental education needs to focus not only on increasing average scores but also on reducing the proportion of students with low environmental awareness, particularly in rural schools.

Table 2: Comparison of Overall Environmental-Awareness Scores

Group	N	Mean	SD	Mean Difference	<i>t</i>	df	<i>p</i>	Cohen's <i>d</i>
Rural	120	26.70	4.20	2.60	4.91	238	< .001	0.63
Urban	120	29.30	4.00					

The urban students obtained a mean environmental-awareness score of 29.30, compared with 26.70 among rural students. The mean difference was 2.60 points.

The calculated *t*-value of 4.91 with 238 degrees of freedom is statistically significant at the .05 level ($p < .001$). Therefore, H_0 is rejected.

The Cohen's *d* value of approximately 0.63 indicates a moderate effect. Thus, the observed difference is not merely statistical but has meaningful educational relevance.

The higher score among urban students is consistent with Bairagya's study in neighbouring Malda district, where urban students also demonstrated significantly higher environmental awareness. Similar locality-related differences have been reported by Bordhan and Patra and Panda.

One possible explanation is that urban students may have greater access to formal environmental campaigns, digital resources, environmental clubs and organised school activities. However, this should not be interpreted as evidence that rural students lack environmental knowledge. Rural students may possess considerable experience-based ecological knowledge resulting from their direct interaction with agriculture, soil, water, vegetation and local ecosystems.

The result also differs from studies such as Rathee and Thakran and Alam, which reported no significant rural-urban difference. This variation suggests that geographical location alone cannot explain environmental awareness. Educational resources, parental education, school activities, media exposure and teacher practices may operate together with residential background.

Table 3: Comparison Across Environmental-Awareness Dimensions

Dimension	Rural Mean	Urban Mean	<i>t</i>	<i>p</i>	Result
Pollution & environmental health	5.55	6.15	3.87	< .001	Significant
Natural-resource conservation	5.30	5.75	3.03	.003	Significant
Waste & energy awareness	5.10	5.65	3.48	< .001	Significant
Biodiversity & climate awareness	5.55	6.05	3.44	< .001	Significant
Environmental responsibility	5.35	5.65	1.55	.123	Not significant

The results demonstrate that rural-urban differences occur in four of the five dimensions.

Urban students score significantly higher in pollution and environmental health, natural-resource conservation, waste and energy awareness, and biodiversity and climate awareness.

However, environmental responsibility does not differ significantly between the groups.

This is an important finding. It suggests that the rural-urban difference is more pronounced in formal environmental knowledge and awareness than in the broader sense of personal responsibility.

The largest difference is observed in pollution and environmental health, suggesting that urban students may receive greater exposure to pollution-related issues through their immediate surroundings and educational campaigns.

The difference in waste and energy awareness is also noteworthy. Urban environments generally generate substantial quantities of visible solid waste and provide greater exposure to organised waste-management campaigns. Such exposure may contribute to greater formal awareness.

The smaller difference in environmental responsibility is particularly significant. Rural students may have practical habits of resource conservation even when their formal environmental-awareness scores are comparatively lower. Thus, environmental education should distinguish between knowledge, attitude and behaviour rather than assuming that higher factual knowledge automatically produces stronger environmental responsibility.

Table 4: Gender-wise Comparison of Environmental Awareness

Gender	N	Mean	SD	<i>t</i>	<i>p</i>	Decision
Male	120	28.00	4.15	0.57	.571	Not significant
Female	120	28.15	4.05			

The difference between male and female students is only 0.15 points and is statistically insignificant ($p = .571$). Therefore, H_02 is accepted.

The result suggests that gender does not substantially influence overall environmental awareness within the model sample. This is broadly consistent with several previous studies that found limited or no gender differences.

The implication is that environmental programmes should be designed inclusively for all students rather than targeted primarily at one gender.

6. Hypothesis-wise Summary

Hypothesis	Result	Decision
H_01 : No rural-urban difference in overall awareness	$t = 4.91, p < .001$	Rejected
H_02 : No gender difference	$t = 0.57, p = .571$	Accepted
H_03 : No rural-urban difference across dimensions	Significant in 4 of 5 dimensions	Partially rejected

7. Major Findings

The study produces the following principal findings:

1. Environmental awareness among the students is predominantly moderate.
2. Urban students have a higher proportion of high environmental awareness than rural students.
3. Urban students obtain a significantly higher overall environmental-awareness score.
4. The rural-urban difference has a moderate practical effect.
5. Gender does not produce a significant difference in overall environmental awareness.
6. Rural-urban differences are significant in four major environmental dimensions.
7. Environmental responsibility does not differ significantly between rural and urban students.
8. The findings suggest that residential background is associated particularly with formal environmental knowledge, while responsible environmental orientation may be more evenly distributed.

8. Educational Implications

The findings indicate the need for environmental education that is locally relevant and activity-based.

For rural schools, environmental education can be linked with:

- agriculture;
- soil conservation;
- ponds and water resources;
- local vegetation;
- biodiversity;
- groundwater;
- sustainable farming.

For urban schools, activities can focus on:

- solid waste;
- plastic pollution;
- traffic emissions;
- energy consumption;
- water conservation;
- urban biodiversity.

Schools should establish active environmental clubs and provide students with opportunities for field observation, environmental surveys, plantation activities, waste segregation and water-conservation projects.

The objective should not simply be to increase examination scores. Environmental education should help students transform knowledge into responsible behaviour.

9. Recommendations

1. Rural schools should receive greater access to environmental teaching-learning resources.
2. Every secondary school should conduct regular environmental activities.
3. Environmental clubs should undertake practical projects throughout the academic year.
4. Field-based environmental learning should be incorporated into secondary education.
5. Local environmental problems of Uttar Dinajpur should be used as teaching examples.
6. Teachers should be trained in experiential and place-based environmental education.
7. Rural and urban students should be encouraged to participate in joint environmental projects.

8. Assessment should include environmental knowledge as well as participation and responsible behaviour.

10. Limitations

The study is limited to secondary school students of Uttar Dinajpur district and focuses principally on environmental awareness. The cross-sectional design does not establish causal relationships. Factors such as parental education, socioeconomic status, school infrastructure, internet access and previous participation in environmental programmes were not independently controlled.

11. Conclusion

Environmental awareness is an important component of secondary education because students' environmental knowledge and attitudes can influence future patterns of resource use and environmental responsibility. The present study focused on rural and urban secondary school students of Uttar Dinajpur district and examined environmental awareness through several dimensions rather than relying solely on a general awareness score. The model findings show that urban students have significantly higher environmental-awareness scores than rural students. However, the absence of a significant difference in environmental responsibility provides an important qualification. Higher formal knowledge does not necessarily imply greater environmental responsibility. The findings therefore support a shift from conventional information-based environmental education towards place-based, experiential and participatory learning. Rural schools can use agriculture, water bodies, soil and biodiversity as learning resources, while urban schools can focus on waste, pollution, energy and urban ecological problems. Most importantly, the rural-urban difference should not be interpreted as an inherent difference in students' environmental values or abilities. Rather, it should encourage educational institutions to provide equitable opportunities for environmental learning. For Uttar Dinajpur, strengthening environmental clubs, field activities, local environmental projects and teacher training can help bridge differences in formal environmental awareness while building responsible environmental behaviour among students in both rural and urban areas.

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